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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/570,054	10/17/2006	Mi Wang	7095UL-1	3047
23442 SHERIDAN ROSS PC 1560 BROADWAY SUITE 1200 DENVER, CO 80202	7590 09/24/2010		EXAMINER TELXEIRA MOFFAT, JONATHAN CHARLES	
			ART UNIT 2863	PAPER NUMBER
			MAIL DATE 09/24/2010	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/570,054

**Applicant(s)**

WANG, MI

**Examiner**

JONATHAN TEIXEIRA MOFFAT

**Art Unit**

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22, 24 and 26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22, 24 and 26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB06)  
Paper No(s)/Mail Date 4/24/2006
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ ~~Notes of Informal Patent Application~~
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

As of applicant's preliminary amendments of 2/28/2006, claims 23 and 25 are cancelled leaving claims 1-22, 24 and 26 for examination.

***Specification***

The disclosure is objected to because of the following informalities:

Applicant is reminded to include a header along the lines of "Background of Invention" before the relevant discussion. Also, applicant is reminded to include reference to PCT and foreign priority in the specification.

Appropriate correction is required.

***Drawings***

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

From figure 5, label "6". From figures 10-11, none of the labels appear to be present in the specification.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not

accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

Claims 2-22 are objected to because of the following informalities:

Each of these dependant claims begins "a system as claimed in..." where it should be "The system of claim..."

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1.

Claims 4, 7-8 and 12-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 4, the phrase "preferably via an IEEE1394 interface" is indefinite as the term "preferably" does not inherently imply whether or not such an interface is used. For the following prior art rejection, the examiner assumes that it is not critical or inherent.

Claims 7-8 mention a "third" and "fourth" digital signal processing modules. However, the parent claim only mentions a "plurality" which does not inherently imply any more than two. Thus "third" and "fourth" lack antecedent basis.

In claim 12, the phrase "eight AD844 chips or equivalents" is indefinite as one of ordinary skill in the art would not be able to determine the scope of "equivalents".

Claims 12-22 lack antecedent basis. Their parent claim 11 recites that each subsystem my include “one or more of...” a set of components yet each of claims 12-22 assumes that a particular one of that set is included. For example, claim 12 recites “said voltage controlled current source” but the “one or more of” language from claim 11 means that such a component may not be included.

Additionally, claim 12 states that the inverting inputs are “cascaded together” with a resistor. However, from figure 5 it is clear that they are not cascaded, but merely connected via a resistor which is not “cascading” as it is known and understood in the art.

Claims 13 and 14 reference 4 negative/positive outputs while parent claim 12 recites 8 amplifiers meaning there should be 8 matching negative/positive outputs. These claims also assume that AD844 chips are used as opposed to the “or equivalent” option from parent claim 12.

From claim 15, it is unclear what the recited “DC restore facility” is restoring. Further, this claim recites that it cancels DC offsets at “the current outputs” without referencing which outputs are being referred to. This claims also assumes that AD844 chips are used as opposed to the “or equivalent” option from parent claim 12.

In claim 17, it is unclear what signal “different signal frequencies” refers to as no signal other than a clock signal and a staircase signal are previously disclosed. Additionally, there is no indication of to what the “sampling rates are provided” or what is being sampled using this sampling rate.

In claim 19, although 16 PGAs are shown in figure 8, there are not 16 sets. Further, there appears to be only 1 FIFO memory per 8 PGA, not one each as in the claim language.

In claim 22, the term "prematurely" is indefinite. If a special condition is required to validate data at the correct time, this should be claimed. If this is a recitation of the inherent functionality of a flip-flop, then the language is redundant and should be omitted.

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2.

Claim 26 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The claims are drawn to a "computer readable medium". The broadest reasonable interpretation of a claim drawn to a computer readable medium covers forms of non-transitory tangible media and transitory propagating signals *per se* in view of the ordinary and customary meaning of computer readable media, particularly when the specification is silent (see MPEP 2111.01). Because the broadest reasonable interpretation covers a signal *per se*, a rejection under 35 USC 101 is appropriate as covering non-statutory subject matter. See 351 OG 212, Feb 23 2010.

The Examiner suggests that Applicant amends the claims as follows: "non-transitory computer readable medium containing computer instructions stored therein for causing a computer processor to perform".

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**3.**

Claims 1-11, 24 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Bai (US pat 4486835).

**With respect to claim 1**, Bai discloses an EIT apparatus (Abstract) for two-phase flows (Figs 7-8; *in-phase and quadrature components shown*) comprising:

1) A dual-plane sensor (Fig 6 item 46).

2) A plurality of digital signal processing modules configured in a data pipeline processing arrangement (Fig 6 items 54). *Four such modules are disclosed.*

3) A plurality of data acquisition subsystems in communication with a first one of said plurality of digital signal processing modules (Fig 6 item 58). *Four of such modules are disclosed.*

**With respect to claim 2**, Bai discloses that said data acquisition subsystems are in communication with a first one of said plurality of digital signal processing modules via a data acquisition interface (Fig 6 item 56).

**With respect to claim 3**, Bai discloses that the data pipeline processing arrangement is capable of acquiring and/or processing 1000 dual frames per second per dual-plane (Fig 3 and column 4 lines 61-67). *Up to 1kHz is disclosed.*

**With respect to claim 4**, Bai discloses that said digital signal processing modules are selectively in communication with a remote PC, via an interface (Fig 5 item 48).

**With respect to claim 5**, Bai discloses that a first one of said digital signal processing modules is capable of controlling data acquisition and processing (Fig 6 and Abstract).

**With respect to claim 6**, Bai discloses that a second one of said plurality of digital signal processing modules is capable of image reconstruction (Fig 5 item 42 and column 4 lines 21-23).

**With respect to claim 7**, Bai discloses one of said plurality of digital signal processing modules is capable of performing velocity calculations by fusing image data to obtain flow information (column 4 lines 14-17 and column 5 lines 27-34). *Current flows*.

**With respect to claim 8**, Bai discloses that one of said plurality of digital signal processing modules is capable of being configured to carry out additional selected functions (Fig 6 item 54). *Boundary conditions are a function*.

**With respect to claim 9**, Bai discloses transducers for obtaining conductivity, pressure and/or temperature information, the transducers being in communication with one of said data acquisition subsystems (Fig 3 item 32). *This electrode obtains conductivity information*.

**With respect to claim 10**, Bai discloses that said dual-plane sensor comprises an electrode array in communication with one of said data acquisition subsystems (Fig 1).

**With respect to claim 11**, Bai discloses that said data acquisition subsystems each include one or more of a voltage controlled current source (Fig 3 item 26), an equal-width pulse synthesizer (Fig 3 item 20) and an over-zero switch (Fig 3 item 30). *Amplifier 26 provides an output current based on input voltage. Signal generator 20 provides a sine wave which thus has*



*equally spaced pulses and A/D 30 will output '1' or '0' and thus has a threshold or switch between them making it an 'over-zero switch'.*

**With respect to claim 24,** Bai discloses a method comprising providing an EIT system (Fig 6) and processing electrical impedance tomography data from two-phase flows (Figs 7-8 and Abstract). *Figs 7-8 show phase components including in-phase and quadrature.*

**With respect to claim 26,** Bai discloses computer instructions for an EIT system (Fig 12 and column 8 lines 30-31).

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sabol (US pat 6748044) discloses a tomography system with parallel processing modules.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN TEIXEIRA MOFFAT whose telephone number is (571)272-2255. The examiner can normally be reached on Mon-Fri, from 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jonathan C. Teixeira Moffat/  
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9/22/2010